Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1.(currently amended) A method for isolation of biological macromolecules, said method comprising contacting at least one filter with a biological sample comprising the biological macromolecules of interest, wherein the pore size of said filter increases in the direction of sample flow; wherein genomic DNA comprised by said biological sample is sheared by said filter.

2. (original) The method of claim 1, wherein said biological sample is a cellular lysate.

3. (original) The method of claim 2, wherein said cellular lysate is derived from eukaryotic cells.

4. (original) The method of claim 2, wherein said cellular lysate is derived from prokaryotic cells.

5. (original) The method of claim 3, wherein said eukaryotic cells are selected from the group consisting of fungi, fish cells, yeast cells, plant cells and animal cells.

6. (original) The method of claim 1, wherein said biological macromolecules are nucleic acid molecules.

7. (original) The method of claim 1, wherein said biological macromolecules are protein molecules.

8. (original) The method of claim 6, wherein said nucleic acid molecules are RNA molecules.

9. (original) The method of claim 8, wherein said RNA molecules are mRNA molecules.

10. (original) The method of claim 6, wherein said nucleic acid molecules are DNA molecules.

11. (original) The method of claim 10, wherein said DNA molecules are vectors or plasmids.

12. (original) The method of claim 1, wherein said filter comprises at least two filter layers.

13. (currently amended) The method of claim 12, wherein said at least one filter comprises a first filter layer and a second filter layer, wherein ~~a~~ said first filter layer has a pore size smaller than the second filter layer, and wherein said sample first contacts said first filter layer and then contacts said second filter layer.

14. (original) The method of claim 13, wherein said second filter layer comprises at least one frit.

15. (currently amended) The method of claim 14, wherein genomic DNA is sheared by said second filter layer; and wherein said second filter layer comprises pores ~~of sufficient size to shear genomic DNA, and said pore size is~~ larger than that of the first filter layer.

16. (original) The method of claim 15, wherein said pore size of said second filter layer is about 1 μm to 500 μm.

17. (original) The method of claim 16, wherein said pore size of said second filter layer is about 10 μm to 70 μm.

18. (original) The method of claim 17, wherein said pore size of said second filter layer is about 20 μm.

19. (original) The method of claim 14, wherein said second filter layer comprises two frits.

20. (original) The method of claim 19, wherein each of said frits are about 1/16 inch thick.

21. (original) The method of claim 13, wherein said first filter layer comprises pores of sufficient size to retard the flow of cellular debris and particles.

22. (original) The method of claim 21, wherein said pores of said first filter layer are about 0.1 μm to 1.0 μm in diameter.

23. (original) The method of claim 21, wherein said pores of said first filter layer are about 0.2 μm in diameter.

24. (original) The method of claim 13, wherein said second filter layer is comprised of polyethylene, polypropylene or a combination thereof.

25. (original) The method of claim 13, wherein said first filter layer is comprised of one or more materials selected from the group consisting of hydrophobic polysolfone, hydrophilic polyether sulfone, cellulose, acetylated cellulose, nitrocellulose, polyester, polyolefin, scintered polyethylene, porous ceramics, silica, and polysaccharide.

26. (original) The method of claim 25, wherein said first filter layer is comprised of regenerated cellulose.

27. (currently amended) The method of claim 26, wherein said first filter layer is comprised of regenerated cellulose, with a pore size of about 0.2 μm, and said second filter layer is comprised of polyethylene or polypropylene, with an average pore size of about 20 μm.

28. (original) The method of claim 1, wherein said filter is provided in a form selected from the group consisting of wafer, cylindrical, rectangular, beads, gels, square, cartridge, swab tip, plug, frit, membrane, sheets or inserts.

29. (currently amended) The method of claim 1, wherein said filter is provided in a form that is suitable to be inserted into a tube, microspin tube, microfuge tube, spin cartridge, vial, ampule, bag or suitable to fit multi-well plates typically used in processing of multiple samples, including, 6-well plates, 12-well plates, 24-well plates, 48-well plates, 96-well plates, 384-well plates, ~~and the like,~~ or suitable to fit into other plate sizes such as 35 mm plates, 60 mm plates, 100 mm plates, or 150 mm plates~~, and the like~~.

30. (original) The method of claim 1, wherein the flow of the sample is facilitated by centrifugation, gravity, pressure, vacuum, or any combination thereof.

31. (currently amended) A method for isolation of biological macromolecules, said method comprising;

(a) contacting cells or cellular source containing the macromolecules of interest with a composition capable of lysing all or substantially all of said cells to give a lysate; and

(b) contacting the lysate with a filter, wherein the filter comprises two or more filters, and wherein the pore size increases in the direction of sample flow; and

(c) promoting the flow of the sample through the filter;

wherein genomic DNA comprised by said cells or cellular source is sheared by said filter.

32. -54. (cancelled)

55. (currently amended) A process for isolating biological macromolecules comprising, separating a lysed natural source in a sample by filtration, wherein said sample is passed through a filter, the pore size of said filter increasing in the direction of sample flow through the filter; wherein genomic DNA comprised by said sample is sheared by said filter.

56. (original) The process according to claim 55, wherein the sample flow through the filter is promoted by applying positive or negative pressure, or by gravity, or by gravity increased by centrifugation, or by a combination thereof.

57. (original) The process according to claim 55, wherein said nucleic acid is plasmid DNA or genomic DNA having a size of from 1 to 50 kb (kilo base pairs).

58. (original) The process according to claim 55, wherein said sample is passed through a filter composed of a multitude of layers wherein, with respect to a particular initial pore size, the subsequent layers have increasingly larger pore sizes.

59. (original) The process according to claim 55, wherein said sample is passed through a filter comprising at least one layer whose pore size increases in the direction of sample flow.

60. (original) The process according to claim 55, wherein said pore size ranges from 1 μm to 500 μm, the total thickness of the filter bed being from 0.1 mm to 10 mm.

61. (original) The process according to claim 55, wherein said sample is passed through a two-layered filter bed wherein the first filter layer has a pore size of from 0.1 to 1.0 μm, and the second filter layer has a pore size of from 1 to 500 μm.

62. (currently amended) The process according to claim 55, wherein said ~~filter layers of said~~ filter comprises one or more filter layers ~~are~~ composed of sintered polyethylene, polypropylene, polytetrafluorethylene, glass, silica gel, alumina, or packed diatomaceous earth, ~~e.g.,~~ cellite or silica gel, interwoven or cemented non-wovens of polypropylene, polyester, glass fibers and [[-]] silica, as well as paper, compressed paper, paper non-wovens, hydrophobic polysolfone, hydrophilic polyether sulfone, cellulose, acetylated cellulose, nitrocellulose, polyester, polyolefin, scintered polyethylene, porous ceramics, silica, and polysaccharide.

63. (original) The process according to claim 55, wherein several samples are processed simultaneously.

64-65. (cancelled)